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| 10/604,630 | 08/06/2003 | Guy M. Danner | H-356 | 1629 |
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| DAVID J COLE E INK CORPORATION 733 CONCORD AVE CAMBRIDGE, MA 02138-1002 | | | EXAMINER BODDIE, WILLIAM | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/604,630

Applicant(s)

DANNER ET AL.

Examiner

William L. Boddie

Art Unit

2629

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2,3,5,6,11 and 22-25 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 2,3,5,6,11 and 22-25 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

1. In an amendment dated, July 30th, 2007, the Applicant cancelled claims 1, 7-10, 26, and amended claims 2-3 and 5-6. Currently claims 2-3, 5-6 and 22-25 are pending.

Response to Arguments

2. Applicant's arguments with respect to claims 2-3, 5-6, 11 and 22-25 have been fully considered but they are not persuasive.

3. On pages 4-6 of the Remarks, the Applicants argue that it would have not been obvious to combine Sato with Duthaler and Leibowitz. The Applicants first argue that there is negligible heat generation within the electro-optic medium during operation.

While the Applicants' statement is true, this is not the full story. As disclosed by Duthaler, it is important that the electro-optic medium stay within a defined temperature range to ensure good display quality (col. 9, lines 51-61). As such, even though the electro-optic medium operation does not itself, generate heat, it is important to maintain the medium within a certain thermal range. Duthaler expressly contemplates thermoelectric cooling to move "thermal energy from the display to a suitable heat sink" (col. 9, lines 60-61). Thus it would seem clear that the sum of temperature variables which effect the display (control circuitry heating, limited heating caused by electro-optic medium operation, environmental factors, etc.) are sufficient for Duthaler to actively disclose taking measures to control the display temperature.

4. The Applicants argue that Sato, a plasma display, owes its large heat generation to the manner in which it is operated. While the Examiner agrees that plasma displays will generate more heat due to the actual operation of display than electro-optical

displays, this does not change the core goal. In Sato, the goal is to lower display temperature regardless of what caused the high temperature in the display. It should be noted that the temperature of the plasma display of Sato is not solely affected by the operation of the display. Other factors, control circuitry heating, and environmental factors, for instance, will undoubtedly play a part in the temperature of the display, just as they did in Duthaler. In short, it does not seem extremely relevant how the temperature of the display increased. What is important is that the display performance of both displays, plasma and electro-optic, can be increased by some means of cooling. As such, the Examiner sees no reason why the cooling method of air gap and fan, disclosed by Sato, would not work to also cool the electro-optic display of Duthaler.

5. Finally, it simply does not seem reasonable that one of ordinary skill in the art at the time of the invention would not even consider Sato's invention because it involves a plasma flat panel rather than an electro-optic flat panel. It seems obvious that one of ordinary skill when confronted with a heightened flat display panel temperature would look to how this problem has been addressed in other flat display panels.

6. On pages 5-6 of the Remarks, the Applicants further point to the different functions of the air gap in the Sato invention compared to the Applicants present invention. The Applicants are advised that none of the functions of their air gap are currently claimed as limitations in the claims. Furthermore, these arguments seem to address the intended use of the air gap. It is well settled that the intended uses of an apparatus have no significance in determining patentability of apparatus claims. *Ex parte Thibault*, 164 U.S.P.Q. 666 (Bd. Pat. App. 1969).

Art Unit: 2629

7. As shown above, the rejection of claims 2-3, 5-6, 11 and 22-25 is seen as proper and is thus maintained. The below rejections have been updated, only to address the altered dependencies of the current claims.

Claim Objections

8. Claims 2-3 and 5-6 are objected to because of the following informalities: each claim states "the heat shield." There is insufficient antecedent basis for this element of the claim. The Applicants are requested to either include discussion of a heat shield in independent claim 11, or amend the claims to recite "a heat shield." Appropriate correction is required.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 2-3, 5-6, 11 and 22-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Duthaler et al. (US 6,312,304) in view of Leibowitz et al. (US 4,689,110) and further in view of Sato et al. (US 5,869,919).

With respect to claim 11, Duthaler discloses, an electro-optic display comprising: a layer of reflective electro-optic material (18 in fig. 1) capable of changing its optical state on application of an electric field thereto (col. 3, lines 61-65);
an electrode arranged to apply an electric field to the layer of electro-optic material (24 in fig. 3);

a heat generating component in heat conducting relationship with the layer of electro-optic material (74 in fig. 6a/b), the heat generating component being disposed on the opposed side of the electrode from the layer of electro-optic material (clear from figs. 6a/b).

wherein a printed circuit board (70 in fig. 6a/b) is placed between the heat generating component and the electrode, the printed circuit board extending across the whole area of the layer of electro-optic material (clear from figs. 6a/b).

Duthaler does not explicitly disclose, a heat shield disposed between the heat generating component and the electrode, the heat shield comprising a layer of thermally conducting material.

Leibowitz discloses, creating a printed circuit board / heat shield with layers of thermally conducting material (copper, 20 in fig. 2); wherein conducting materials extend across the entire board (clear from fig. 2).

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the circuit board of Duthaler (70 in fig. 6b) with the heat-shielded multi-layered circuit board of Leibowitz.

The motivation for doing so would have been to improve the coefficient of thermal expansion, thermal conductivity, and mechanical strength of the circuit board (Leibowitz; col. 3, lines 13-19).

Neither Leibowitz nor Duthaler expressly disclose that an air gap is present between the circuit board and the electrode of the display.

Sato discloses, a display device having an air gap (note the flowing arrows) between a circuit board (820 in fig. 8) and the electrodes of a display (201 in fig. 8).

Leibowitz, Duthaler and Sato are all analogous art because they are all from the same problem area namely circuit board manufacturing and packaging.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include an air gap between the circuit board, of Leibowitz, and the display electrodes of Duthaler.

The motivation for doing so would have been to effectively cool the display as well as the drive circuits (Sato; col. 12, lines 38-42).

Therefore it would have been obvious to combine Leibowitz with Duthaler and subsequently Sato for the benefit of improved thermal conductivity, and effectively cooling the drive circuits to obtain the invention as specified in claim 11.

With respect to claim 2, Duthaler, Leibowitz and Sato disclose, an electro-optic display according to claim 11. (see above).

Duthaler, when combined with Leibowitz and Sato, further discloses, wherein the heat shield comprises a printed circuit board (Leibowitz; figs. 1 and 2) having a conductive layer therein (Leibowitz; copper layers, 20 in fig. 2).

With respect to claim 3, Duthaler, Leibowitz and Sato disclose, an electro-optic display according to claim 11 (see above).

Duthaler, when combined with Leibowitz and Sato, further discloses, wherein the heat shield comprises a plurality of layers of thermally insulating material (Leibowitz; 18 in fig. 2; PTFE) and a plurality of layers of thermally conducting material (Leibowitz; 20

in fig. 2; Copper), the layers of thermally insulating material alternating with the layers of thermally conducting material (Leibowitz; clear from fig. 2), and one layer of thermally conducting material (Leibowitz; note the outer layers of copper, 20 in fig. 2) being disposed between the layers of thermally insulating material and the layer of electro-optic material (upon combining the two Duthaler with Leibowitz and Sato this limitation would clearly be satisfied).

With respect to claim 5, Duthaler, Leibowitz and Sato disclose, an electro-optic display according to claim 11 (see above).

Duthaler, when combined with Leibowitz and Sato, further discloses, wherein the heat shield comprises a polymeric film (Leibowitz; PTFE (polytetrafluoroethylene)) having a metal layer (Leibowitz; copper, 20 in fig. 2) formed thereon (Leibowitz; col. 3, lines 58-62).

With respect to claim 6, Duthaler, Leibowitz and Sato disclose, an electro-optic display according to claim 5 (see above).

Duthaler, when combined with Leibowitz and Sato, further discloses, coating the polymeric layer with a conductive metal. While Leibowitz disclosing using copper (col. 4, lines 52-53), it would have been obvious to use aluminum instead as it is well known as a conductive metal.

The motivation for doing so would have been the decreased cost of aluminum over copper.

With respect to claim 22, Duthaler, Leibowitz and Sato disclose, an electro-optic display according to claim 11 (see above).

Duthaler further discloses, wherein the electro-optic material comprises a rotating bichromal member material or an electrochromic material (col. 7, lines 8-45).

With respect to claim 23, Duthaler, Leibowitz and Sato disclose, an electro-optic display according to claim 11 (see above).

Duthaler further discloses, wherein the electro-optic material comprises an electrophoretic material (col. 7, lines 8-9).

With respect to claim 24, Duthaler, Leibowitz and Sato disclose, an electro-optic display according to claim 23 (see above).

Duthaler further discloses, wherein the electrophoretic material comprises at least one capsule having a capsule wall encapsulating a suspending fluid and a plurality of electrically charged particles suspended in the suspending fluid and capable of moving therethrough on application of an electric field to the electrophoretic material (col. 7, lines 8-45).

With respect to claim 25, Duthaler, Leibowitz and Sato disclose, an electro-optic display according to claim 23 (see above).

Duthaler further discloses, wherein the electrophoretic material comprises a substrate having a plurality of closed cells formed therein, each of the cells having therein a suspending fluid and a plurality of electrically charged particles suspended in the suspending fluid and capable of moving therethrough on application of an electric field to the electrophoretic material (col. 7, lines 8-45; also note figures 6a-b).

Conclusion

Art Unit: 2629

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

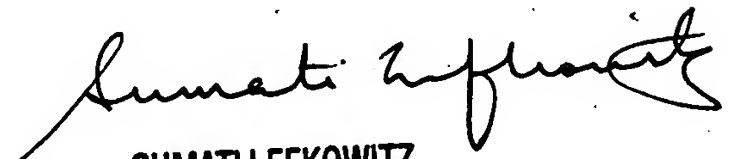
12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to William L. Boddie whose telephone number is (571) 272-0666. The examiner can normally be reached on Monday through Friday, 7:30 - 4:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on (571) 272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2629

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Wlb
9/28/07


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